

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY



(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 08 JUN 2005

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Applicant's or agent's file reference K 39 656/3am		<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/EP 03/1 1905		International filing date (day/month/year) 27.10.2003		Priority date (day/month/year) 12.12.2002
International Patent Classification (IPC) or national classification and IPC H01B3/44				
Applicant BOREALIS TECHNOLOGY OY				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input checked="" type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  05.05.2004		Date of completion of this report  06.06.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Lehnert, A Telephone No. +31 70 340-4234 		

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/EP 03/11905

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## Box No. I Basis of the report

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

### Description, Pages

1-13 as originally filed

### Claims, Numbers

1-11 received on 10.01.2005 with letter of 10.01.2005

### Drawings, Sheets

1/3-3/3 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. II Priority**

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1. ☒ This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:
- ☒ copy of the earlier application whose priority has been claimed (Rule 66.7(a)).
  - ☐ translation of the earlier application whose priority has been claimed (Rule 66.7(b)).
2. ☐ This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rule 64.1). Thus for the purposes of this report, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	1-11
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

The following documents (D1 - D6) are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

- D1: EP-A-0 961 295 (UNION CARBIDE CHEM PLASTIC) 1 December 1999 (1999-12-01)
- D2: US-A-3 968 463 (BOYSEN ROBERT L) 6 July 1976 (1976-07-06)
- D3: DE 14 65 640 B (KABEL METALLWERKE GHH) 6 November 1969 (1969-11-06)
- D4: CH 357 096 A (ZIEGLER KARL ;MONTEDISON SPA (IT)) 30 September 1961 (1961-09-30)
- D5: US-A-6 121 335 (HIGASHIKUBO TAKASHI ET AL) 19 September 2000 (2000-09-19)
- D6: EP-A-0 190 889 (HIMONT INC) 13 August 1986 (1986-08-13)

**1. Amendments**

The amended claims are allowable. Basis for the amendments can be found on page 11, third paragraph of the application as originally filed. Thus, the claims as amended with letter of 10.01.2005 fulfil the requirements of Article 19(2)/Article 34(2)(b) PCT.

**2. Novelty**

The amended claims 1-11 are novel over the prior art (documents D1-D6) because none of these documents discloses a haul-off-force  $F_{max} > 5cN$  and a draw-down velocity  $v_{max} > 150 \text{ mm/s}$ .

Consequently, the subject-matter of claims 1-11 is novel over D1-D6 (Article 33(1) and (2) PCT):

**2.1.**

Document D1 (see page 5, paragraph 22) discloses a coaxial cable comprising a propylene or ethylene homo- or copolymer in the dielectric layer, the melt flow rate of the polymer 0.7 to 10 decigrams per minute.

**2.2.**

Document D2 (see claims 1-5) discloses a coaxial cable comprising a dielectric layer containing an ethylene or propylene polymer.

**2.3.**

Document D3 (see claims 1 and 2) discloses the use of a mixture of polyethylenes with polypropylene in coaxial cables.

**2.4.**

Document D4 (see claim 1) discloses the use of crystalline polypropylene or a mixture of crystalline polypropylene and crystalline polybutene in a coaxial cable.

**2.5.**

Document D5 (cited by the applicant, see column 7, lines 8-12 and lines 23-30) discloses a coaxial cable; polypropylene may be used; the melt flow rate of polypropylene is 1.5 - 15 g/10 min.

**2. Inventive step**

As discussed by the applicant in his letter of reply the strain-hardening behaviour of the polymers used in the inventive cables, defined by a haul-off-force  $F_{\max} > 5$  cN and a draw-down velocity  $v_{\max} > 150$  mm/s, leads to improved electrical properties.

There is no document in the prior art that suggests that a change in the mechanical properties of the polymers used to produce a coaxial cable might lead to different or improved electrical properties.

Thus, it would not be obvious for the skilled person to select a propylene homo-or copolymer having a haul-off-force  $F_{\max} > 5$  cN and a draw-down velocity  $v_{\max} > 150$  mm/s for the production of cables as disclosed in independent claims 1 and 11.

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(SEPARATE SHEET)**

International application No.

**PCT/EP 03/11905**

Thus, the subject-matter of claims 1-11 involves an inventive step in the meaning of Article 33(1) and 33(3) PCT.

### Claims

1. A coaxial or triaxial cable comprising a dielectric layer which comprises as a component (A) a propylene homo- or copolymer having strain hardening behaviour.  $\langle \rangle^1$
2. Cable according to claim 1, wherein the dielectric layer further comprises as a component (B) a medium or high density ethylene homo- or copolymer and/or a non-strain hardening behaviour propylene homo- or copolymer.
3. Cable according to claim 2, wherein component (B) comprises a propylene homo- or copolymer having a catalyst residue of less than 50 ppm, an ash content below 100 ppm and a chloride content of less than 5 ppm.
4. Cable according to claim 3, wherein the propylene homo- or copolymer is having a catalyst residue of less than 5 ppm, an ash content below 30 ppm, and a chloride content of less than 1 ppm.
5. Cable according to any of claims 3 and 4 wherein component (B) comprises at least 50 wt% of said polypropylene.
6. Cable according to any of the preceding claims, wherein the ratio of components (A):(B) is from 1:99 to 60:40, more preferably from 25:75 to 60:40.
7. Cable according to any of the preceding claims wherein the propylene homo- or copolymer having strain hardening behaviour  $\langle \rangle^1$  and has a melt flow rate of 0.1 to 25 g/10min at 230°C/2.16kg.
8. Cable according to any of the preceding claims wherein the dielectric layer has been expanded, preferably by physical foaming.
9. Cable according to claim 8, wherein the degree of expansion is at least 60%, more preferably at least 75%.

*< with a haul-off force  $F_{max} > 5 \text{ cN}$  and a draw-down velocity  $v_{max} > 150 \text{ mm/min}$  >*

AMENDED SHEET

10. Cable according to any of the preceding claims wherein the dielectric layer further comprises a nucleating agent, preferably in an amount of 0.01 to 0.05 wt%.

11. <sup><>1</sup> Use of propylene homo- or copolymer having strain hardening behaviour for the production of a dielectric layer of a coaxial or triaxial cable.

*<with a haul-off force  $F_{max} > 5 \text{ cN}$  and a draw-down velocity  $v_{max} > 150 \text{ mm/s} >^1$*